UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/662,404	09/16/2003	Xiang-Dong Yin	70566-0016	9674

22902 7590 06/13/2007

CLARK & BRODY
1090 VERMONT AVENUE, NW
SUITE 250
WASHINGTON, DC 20005

EXAMINER	
JOYNER, KEVIN	
ART UNIT	**PAPER NUMBER**
1744	

MAIL DATE	DELIVERY MODE
06/13/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/662,404	YIN ET AL.	
	Examiner	Art Unit	
	Kevin C. Joyner	1744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 March 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-7 and 18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3, 5-7, and 18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

FINAL ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brutti et al. (U.S. Patent No. 6,521,047) in view of Li et al. (U.S. Patent No. 5,835,678) and Morgandi (U.S. Patent No. 6,067,403).

Brutti discloses a steam on demand generator (as shown in Figure 1), comprising a thin walled stainless steel cup (Referenced as an evaporation chamber 16 and disclosed as stainless steel in column 3, lines 44 and 45 with thin walls as shown in Figure 1), and cap assembly (as broadly defined, the inlet head (12) is a cap), a heating device connected to the stainless steel cup (as disclosed in column 4, lines 6-9), and capable of heating the cup assembly and an interior thereof (referenced as numerals 36, 38, 40, 42, and 44), a water injection device that is a hollow cone spray nozzle in the stainless steel cap that is capable of supplying water onto a stainless steel thin wall of the cup, (As disclosed in column 3, lines 14-17 and as shown in Figure 2; the injector (18) is a hollow cone spray nozzle), a steam outlet (14), and a temperature sensor (56) positioned within the cup assembly. More specifically, the device disclosed is also

capable of supplying water in quantities so that the interior of the cup assembly remains essentially dry during steam generation.

Brutti continues to disclose that the heating device and the temperature sensors are connected to the stainless steel cup, and that the temperature sensor (56) is connected to the stainless steel thin wall that is capable of receiving a portion of water from the supply nozzle. However, Brutti does not appear to disclose that the heating device is connected to the same stainless steel thin wall of the cup that is arranged to receive a portion of water from the supply nozzle. In contrast Brutti appears to disclose using a plurality of chambers for the evaporation of the fluid wherein the heating device is connected to an outer stainless steel chamber (44). Li discloses an on demand steam generator comprising a cup assembly, a heating device (62) for heating the cup assembly and an interior thereof, a water injection device (24), and a temperature sensor (68 and 32) positioned within the cup assembly as disclosed in Figure 2. The reference continues to disclose that the apparatus comprises a single chamber and that the end portion of the temperature sensors (32 and 68) and the heating device (62) are connected to the same thin wall of the stainless cup (column 10, lines 45-68). This is directly contributed to the fact that the in the temperature of the stainless steel walls must be controlled and monitored precisely in order produce the desired vapor quality, and therefore the heating device and temperature sensor must be connected to the stainless steel wall that is capable of receiving the supply of fluid (column 2, lines 45-65). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Brutti to include a heating device connected

to the same stainless steel wall that is capable of receiving a fluid from the hollow cone spray nozzle in order to precisely monitor and control the temperature of the wall to provide the desired vapor quality as exemplified by Li.

Brutti in view of Li is silent with regards to the connection method of the heating device and an end portion of the temperature device to the cup, however brazing is considered a conventionally known technique to connect two materials in the steam generating art. Morgandi provides examples of this conventional teaching wherein the reference discloses an on demand steam generator comprising a heating device (7) for heating the generator, a water injection device (6) for supplying water to the generator, a steam outlet (9A) and a temperature sensor (12) positioned within the generator. The reference continues to disclose that it is known in the art to use the technique of brazing to connect two different materials in a steam generator in column 4, lines 11-20. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to connect the heating device and an end portion of the temperature sensor in the apparatus of Brutti in view of Li to use a brazing technique as is a known and conventional connecting technique as exemplified by Morgandi.

Brutti in view of Li and Morgandi are relied upon as set forth in claim 1. Concerning claim 2, Brutti continues to disclose that the end portion of the temperature sensor (56) is connected to the stainless steel thin wall as shown in Figure 1. Brutti is silent with regards to the type of connection that is utilized between the temperature sensor and the stainless steel wall. As discussed above, brazing is considered a conventionally known technique used to connect two materials in the steam generating

art as exemplified by Morgandi. More specifically, Morgandi provides this conventional teaching in column 4, lines 21-26; displaying that it is known in the art to use the technique of brazing to connect the thermocouple to the inside wall in a steam generator. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to braze the heating device and an end portion of the temperature sensor to the cup in the apparatus of Brutti in view of Li, as is a known and conventional connecting technique as exemplified by Morgandi.

Brutti in view of Li and Morgandi are relied upon as set forth in claim 1. Regarding claim 3, Brutti discloses that the temperature sensor is a thermocouple (column 4, line 16) and at least a side of a tip of the thermocouple directly contacts the stainless steel thin wall, and a tip end surface remains exposed after brazing. More specifically as disclosed in Figure 1, it is evident that the thermocouple is directly connected to the stainless steel wall of the inner chamber (36). It is also evident that a very small portion of the tip end surface remains exposed. Brutti is silent with regards to the type of connection that is utilized between the temperature sensor and the stainless steel wall. As discussed above, brazing is considered a conventionally known technique used to connect two materials in the steam generating art as exemplified by Morgandi. Alternatively, Morgandi further states that a portion of the tip end surface is exposed after the brazing (as shown in Figure 2) in order to accurately measure the temperature of the generated steam. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Brutti to

allow a portion of the tip end surface is exposed after the brazing in order to accurately measure the temperature of the generated steam as exemplified by Morgandi.

Brutti in view of Li and Morgandi are relied upon as set forth in claim 1. Concerning claim 5, the on demand steam generator of Brutti comprises the heating device being a heating coil (column 4, lines 6-10) that surrounds a lower portion of the cup assembly, the lower portion including the stainless steel thin wall.

3. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brutti et al. (U.S. Patent No. 6,521,047 in view of Morgandi (U.S. Patent No. 6,067,403), and Moore (U.S. Patent No. 3,750,399).

Regarding claim 6, Brutti discloses a steam on demand generator (as shown in Figure 1), comprising a thin walled stainless steel (column 3, lines 44 and 45) cup (16), and cap assembly (the inlet head (12) is a cap), a heating device connected to the stainless steel cup (as disclosed in column 4, lines 6-9), and capable of heating the cup assembly and an interior thereof (referenced as numerals 36, 38, 40, 42, and 44), a water injection device that is a hollow cone spray nozzle (18) in the stainless steel cap that is capable of supplying water to the cup, (as disclosed in column 3, lines 14-17), a steam outlet (14), and a temperature sensor (56) positioned within the cup assembly. More specifically, the device disclosed is also capable of supplying water in quantities so that the interior of the cup assembly remains essentially dry during steam generation.

Brutti is silent with regards to the connection method of the heating device and an end portion of the temperature sensor to the cup, however brazing is considered a conventionally known technique to connect two materials in the steam generating art.

Morgandi provides an example of this conventional teaching wherein the reference discloses an on demand steam generator comprising a heating device (7) for heating the generator, a water injection device (6) for supplying water to the generator, a steam outlet (9A) and a temperature sensor (12) positioned within the generator. The reference continues to disclose that it is known in the art to use the technique of brazing to connect two different materials in a steam generator in column 4, lines 11-20. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to braze the heating device and an end portion of the temperature sensor to the cup in the apparatus of Brutti, as is a known and conventional connecting technique as exemplified by Morgandi.

Brutti does not disclose the limitations of a stainless steel stud brazed to a bottom of the stainless steel cup, the stud providing a channel for the temperature sensor to enter the interior. Morgandi also discloses that a stud is brazed to a bottom of the cup, the stud providing a channel for the temperature sensor to enter the interior. More specifically as disclosed in column 4 lines 31-36, the two endpieces are studs that are found at the bottom of a cup. The endpieces are referred to being welded to the cup, wherein brazing is a form of welding (column 4, line 14). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the steam generator of Brutti to include a stud brazed to the bottom of the cup in order to provide a channel for the temperature sensor as exemplified by Morgandi as is an efficient and effective way to connect the stud to the cup and allow the sensor access to the inside of the cup. Morgandi however, is silent with regards to specific materials of the stud;

therefore, it would have been necessary and thus obvious to look to the prior art for conventional materials. Moore provides this conventional teaching showing that it is known in the art to use stainless steel for all the high temperature components of a steam generator in column 4 lines 36-39. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to make the studs in the device of Brutti in view of Morgandi from stainless steel as exemplified by Moore as such is considered a conventional material for the parts in the device.

Regarding claim 7, Brutti in view of Morgandi is relied upon as set forth in reference to claim 6 above. Morgandi continues to disclose in column 4 lines 31-36, that the temperature sensor is brazed to a portion of the stud. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Brutti to braze a portion of the temperature sensor to the stud as exemplified by Morgandi in order to secure the sensor in a fixed position.

4. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brutti (U.S. Patent No. 6,521,047) in view of Morgandi (U.S. Patent No. 6,067,403).

Brutti discloses a steam on demand generator (as shown in Figure 1), comprising a thin walled stainless steel (column 3, lines 44 and 45) cup (16), and cap assembly (the inlet head (12) is a cap), a heating device (50) connected to the stainless steel cup (as disclosed in column 4, lines 6-9), and capable of heating the cup assembly and an interior thereof (referenced as numerals 36, 38, 40, 42, and 44), a water injection device that is a hollow cone spray nozzle (18) in the stainless steel cap that is capable of supplying water to the cup, (as disclosed in column 3, lines 14-17), a steam outlet (14),

and a temperature sensor (56) positioned within the cup assembly as shown in Figure 1. More specifically, the device disclosed is also capable of supplying water in quantities so that the interior of the cup assembly remains essentially dry during steam generation. Brutti is silent with regards to the connection method of the heating device and an end portion of the temperature sensor to the cup, however brazing is considered a conventionally known technique to connect two materials in the steam generating art. Morgandi provides an example of this conventional teaching wherein the reference discloses an on demand steam generator comprising a heating device (7) for heating the generator, a water injection device (6) for supplying water to the generator, a steam outlet (9A) and a temperature sensor (12) positioned within the generator. The reference continues to disclose that it is known in the art to use the technique of brazing to connect two different materials in a steam generator in column 4, lines 11-20. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to braze the heating device and an end portion of the temperature sensor to the cup in the apparatus of Brutti, as is a known and conventional connecting technique as exemplified by Morgandi.

Brutti continues to disclose that the end portion of the temperature sensor (56) is connected at a location on an inside wall of the stainless steel cup, the inside wall capable of receiving spray from the hollow cone spray nozzle. Brutti is silent with regards to the type of connection that is utilized between the temperature sensor and the stainless steel wall. As discussed above, brazing is considered a conventionally known technique used to connect two materials in the steam generating art as

exemplified by Morgandi. More specifically, Morgandi provides this conventional teaching in column 4, lines 21-26; displaying that it is known in the art to use the technique of brazing to connect the thermocouple to the inside wall in a steam generator. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to braze the heating device and an end portion of the temperature sensor to the cup in the apparatus of Brutti in view of Li, as is a known and conventional connecting technique as exemplified by Morgandi.

Brutti also discloses that the temperature sensor is a thermocouple (column 4, line 16) and at least a side of a tip of the thermocouple directly contacts the inside wall, and a tip end surface remains exposed after brazing, in which the thermocouple is perfectly capable of sensing the inside wall temperature and temperature of the fluid inside the cup (for further explanation, see *"(f)"* in the response to arguments section below). More specifically as disclosed in Figure 1, it is evident that the thermocouple is directly connected to the stainless steel wall of the inner chamber (36). It is also evident that a very small portion of the tip end surface remains exposed. Brutti is silent with regards to the type of connection that is utilized between the temperature sensor and the stainless steel wall. As discussed above, brazing is considered a conventionally known technique used to connect two materials in the steam generating art as exemplified by Morgandi. Alternatively, Morgandi further states that a portion of the tip end surface is exposed after the brazing (as shown in Figure 2) in order to accurately measure the temperature of the generated steam. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the

apparatus of Brutti to allow a portion of the tip end surface is exposed after the brazing in order to accurately measure the temperature of the generated steam as exemplified by Morgandi.

Response to Arguments

1. Applicant's arguments with respect to claims 1-3 and 5 have been considered but are moot in view of the new ground(s) of rejection.

Applicants' principle arguments are:

(a) Brutti does not even teach a steam generating unit. Brutti relates to an apparatus for liquid delivery into a chemical vapor chamber.

For the record, steam is defined as water in the form of an invisible gas or vapor. Brutti discloses an evaporator apparatus enabling optimum voltailisation of liquid precursors or precursors in solution to a chemical vapor deposition chamber (column 1, lines 49-55). Thus, the invention is directed to an evaporation apparatus. The definition of evaporate is to change from a liquid or solid to a vapor. The evaporation apparatus is fully capable of being utilized with a water solution, and therefore creating steam.

(b) Brutti is not analogous art and not valid prior art against the claims.

As discussed above, Brutti discloses an evaporator apparatus, which is a steam on demand generator. Therefore, it is analogous art.

(c) Motivation to combine the references of Brutti in view of Morgandi and/or Riba is lacking. Brutti is an apparatus for supplying an evaporated precursor for chemical

vapor deposition. How does one of skill in the art combine Brutti with Morgandi, which relates to a steam generator for a steam iron.

As stated by the applicant, Brutti discloses an apparatus **for** supplying an evaporated precursor for chemical vapor deposition. The simple fact is that the apparatus evaporates liquids into a vapor using a heating means with a temperature sensor. It is fully capable of evaporating water into steam and thus creating a steam generator. As disclosed by the applicant as well, Morgandi and/or Riba utilizes a steam generator in which a liquid is evaporated into steam utilizing a heating means and a temperature sensor, as such is the conventional technique of steam generation. Thus one of ordinary skill in the art would comfortably notice that each apparatus accomplishes the same task of heating a liquid past its vapor point to produce a gas, and therefore combine the teachings of Brutti with Morgandi and/or Riba.

(d) The teaching of Morgandi and/or Riba, Brutti doe not teach the stainless steel cap and cup assembly with the water directed to the cup wall that also has attached thereto the temperature sensor and heating device.

The argument is moot in view of the new grounds of rejection.

2. Applicant's arguments with respect to claims 6 and 18 filed on March 22, 2007 have been fully considered but they are not persuasive.

Applicants' principle arguments are:

(e) Morgandi does not teach a stud brazed to a bottom of the cup as is recited in claim 6. While the Examiner alleges that the end pieces of Morgandi are studs, they are

part of the boiler construction. Claim 6 call for a stud brazed to the bottom end of the cup. At best, the end pieces of Morgandi are the "bottom" not the claimed stud.

A stud is clearly defined at as a simple protuberance projecting from a surface or part. As discussed in the previous action, column 4 lines 31-36 disclose that two endpieces are screwed or welded to the ends of the boiler (5). These two endpieces, which are studs as broadly defined, have the temperature sensor (12A) and prongs fixed to them. Therefore, the two endpieces of Morgandi are studs that are brazed (column 4, line 14) to a bottom of the cup as shown in Figure 2.

(f) The question remains as to whether Brutti also teaches the other feature of claim 18, i.e., "the end portion of the temperature sensor is brazed at a location on an inside wall of the stainless steel cup, the inside wall receiving spray from the hollow cone spray nozzle, and further wherein the temperature sensor is a thermocouple and at least a side of a tip of the thermocouple directly contacts the inside wall...." There is no express disclosure in Brutti that the side of the tip directly contacts the inside wall. Applicants submit that while Brutti does teach that the thermocouple 56 is placed inside the tube to monitor the temperature of the evaporation, this does not imply that the side of the tip is in direct contact with the inside wall to allow for inside wall monitoring temperature. In fact, the wall of the chamber 36 is not heated and the thermocouple 54 is designed to monitor the resistance 50, so why would Brutti have the arrangement of claim 18 for the end of thermocouple 56? There is no need to have the thermocouple directly contact the wall of chamber 36 for wall temperature sensing and there is no basis for the Examiner to conclude that this arrangement is inherent in Brutti.

First, Brutti is not utilized to teach brazing. Riba and Morgandi are two examples in the art of steam generation that it is known to utilize brazing to connect two materials in such an apparatus. Second, the inside wall of chamber (36) is fully capable of receiving a spray from the hollow cone spray nozzle. With regard to the limitation of the thermocouple having at least a side of a tip of the thermocouple directly contacting the inside wall. As discussed in the previous action, it would have been obvious to braze the thermocouple of Brutti on the inside wall as such is a conventionally known technique to connect two materials together. Brazing the thermocouple to the inside wall of the chamber (36) would provide a direct contact between the two pieces.

Concerning the limitations of the thermocouple being capable of measuring the temperature inside the chamber and inside wall monitoring temperature, the Applicants have conceded that the thermocouple measures the temperature inside the chamber. The Applicants contend that the temperature sensor would be capable of measuring the temperature of the inside wall and state that since the wall of the chamber is not heated, then there is no reason to measure the temperature of the inside wall. However, as shown in Figure 1, thermocouple 56 contacts the inside wall of chamber (36) and column 4 lines 17-20 specifically disclose that the thermocouple (56) is utilized to regulate the temperature of the entire evaporator apparatus (10) and not just the evaporation in the chamber itself. Thus, it is perfectly sensible that the thermocouple is fully capable of monitoring the temperature of the wall in order to ensure a temperature in the wall for complete evaporation to achieve an improved evaporation apparatus enabling optimum volatisation of the liquid (column 1, lines 49-52).

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin C. Joyner whose telephone number is (571) 272-2709. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gladys Corcoran can be reached on (571) 272-1214. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KCJ

GLADYS JP CORCORAN
SUPERVISORY PATENT EXAMINER